Kingdom of Belgium

Patent of Invention
Publication Number: 1005243A3

Ministry of Economic Affairs

Application Number: 09100062
Internat'l Classif.: A01G
Date granted: June 8, 1993

The Minister of Economic Affairs,

Considering the law of March 28, 1984 concerning patents of invention, in particular Article 22;

Considering the Royal Decree of December 2, 1986, concerning the application, granting and maintenance of patents of invention, in particular Article 28;

Considering the position paper of January 24, 1991, 12:00 AM (?), developed by the Department of Industrial Intellectual Property,

DECISION:

Article 1: Granted to:
BOAL Systemen B.V (BOAL Systems, Inc.)
Marie Curie street 3, NL-2691 HC The Hague (The Netherlands),

Represented by Lucien Konings,
Patent Bureau Arnold & Siedsma, BVBA,
Hamoirlaan 21a
B-1180 Brussels (Belgium),

A patent of invention for the duration of 20 years, subject to payment of annual taxes, concerning
Greenhouse and Associated Windowpane Attachment/Support Profile Structure.

Inventor(s): Gerardus Jacobus Maria van Holsteijn,
Plein 56, NL-2291 CC Wateringen (The Netherlands)

Article 2: This patent has been granted at the requester(s)' own risk, without prior investigation of its patentability, without guarantee as to its value or the correctness of the description of the invention.

Brussels, June 8, 1993,
By Special Proxy:

G. de Cuypere,
Executive Secretary

Greenhouse and Associated Windowpane Attachment/Support Profile Structure

The invention concerns a greenhouse comprising a system of columns, trusses (horizontal support beams) and gutters, a covering of windowpanes and associated windowpane profiles. The covering of the invention is mounted in place onto the walls and the roof areas of the greenhouse.

The windowpanes, which usually consist of single or multiple glass plates or panels of transparent man-made material, are kept in place in a watertight manner by means of attachment/support profiles. Depending on their location, these profiles are identified by the names: roof ridge, rod, lintel, and gutter edge or window edge.

An attempt is made to keep these profile structures as narrow as possible in order to minimize the loss of light caused by them.

The objective of the invention is to lower the loss of light that is caused by the profile structures. To that end, at least one attachment/support profile of the covering is constructed from a transparent material. The invention is based on the idea that certain attachment/support profile structures that are installed in the covering, such as rods, do have a load-bearing function, whereas other profile structures carry little or no weight and therefore do not have to be made out of metal.

Roof ridge profiles, gutter edge profiles, window edge profiles and lintels may be constructed from a transparent man-made material (such as, PVC, acrylic or carbonate) without having a negative impact on the integrity of the covering.

It is equally conceivable to construct a number of rods out of metal and construct the rest of the rods from a transparent man-made material.

The invention also deals with and provides a window-pane-attachment/support profile for a greenhouse.

The aforementioned and other characteristics of the invention will become clear from the following description, which is based on a drawing containing the following diagrams:

Figure 1: a perspective view of part of a greenhouse in accordance with the invention;
Figure 2: a perspective view of detail II of Figure 1;
Figure 3: a perspective view of a detail that corresponds to detail III of Figure 1 of a different greenhouse in accordance with the invention;
Figure 4: a detail that corresponds to detail IV of Figure 3 pertaining to a different greenhouse
in accordance with the invention;
Figure 5: a perspective view of a variation of detail II of Figure 1.

The greenhouse 1 of Figure 1 comprises a system of columns 2, trusses 3 and perpendicular gutters 4. The walls of the greenhouse also contain girders 5 to support the framework. The system also includes cross bracing ties 6. The greenhouse 1 is further provided with coverings 7 for the wall and roof areas. These coverings 7 include windowpanes 8 and windowpane attachment/support profiles, namely roof ridge profiles 9, rod profiles 10, window edge profiles 11, windowsill profiles 12 and gutter edge profiles 13. Each of the windowpane attachment/support profiles 9 - 13 is provided, as a minimum, with a flange on which the edge of the pane rests. Preferably, each of the pane attachment/support profiles 9-13 is constructed with a groove in which the edge of the windowpane is secured, often on both sides of a plane of symmetry. In the examples presented in the drawing, the rod profiles 10 are made from aluminum, which, when used in pairs and with the interpolation of a roof ridge profile 9, will constitute a sturdy cover. Each of the rod profiles 10 consists of a cylinder (tube) 14 with an attached T-piece 15 and two small T-pieces 16. Below the T-piece 15 are two grooves 17 for accommodating the edges of the pane. The roof ridge profile 9 of Figure 2 consists of a body 18 with on both sides sloping grooves 19 that fit together with the edges of the window pane and also has a window hinge head 20 and a bolt chamber 21 which accommodates the screw head 22 of a rod-anchoring system 23. The rods 10 each grab with their grooved ends 24 around the grooved flanges 25 of the roof ridge profile 9.

A gutter edge profile 13 which has an attachment/support surface 27 with a ledge 29 to accommodate the edge of the windowpane and which inserts into the grooved ends 28 of the rods 10, grabs around each edge 26 of the steel gutter 4. An anchoring system 30 anchors the rods 10 to the gutter 4.

Locally, the lower edge of the window opening for each window 32 is delimited by a window sill profile 12 which is constructed with a groove 33 to accommodate the edge of a window and with a stop flange 34 for a window 32. The ends of the windowsill profile 12 grab

onto a rod 10 by means of a recess 35. The window sill profile 12 is held in place via a rubber window sill sealing strip 31 that has been inserted into the groove 17 of the rod 10. Figure 4 shows a somewhat different configuration of a windowsill profile 12.

A window 32 has four window edge profiles, namely a hinged edge profile 37, two lateral edge profiles 38, and an edge profile for connecting the window pane 39, and also an intermediate profile 46. Each of these profiles 37-39 has a groove 40 for accommodating the edge of a windowpane and they have the profile shapes as shown in Figure 3.

The above-mentioned windowpane profiles, namely the roof ridge profile 9, the window sill profile 12 and the gutter edge profile 13 are constructed from transparent man-made material, e.g., PVC, acrylic or carbonate.

In the event that the windowpanes 8 are sturdy enough, the windowpane edge profiles 37, 38 and/or 39 can also be constructed from such transparent man-made materials. It is also feasible that at least some of the rods can be constructed from such transparent man-made material, in which case the remaining rods assume the weight-bearing attachment/support function. The advantage of the use of such transparent man-made materials is that it generates a considerable increase in the amount of daylight that can get in, which in turn considerably increases cultivation yields. In addition, it decreases the risk of windowpane breakage because the edges of the window are mounted in profiles made of flexible material.

Figure 5 shows in principle the same as does Figure 2, with the understanding that the roof ridge profile 9, which is made of transparent man-made material, is less high and that a somewhat higher anchoring system 23 is applied. The transparent gutter edge profile 13 also has a somewhat different configuration.

Any sealing gaskets potentially applied in greenhouse 1 in accordance with the invention that are not drawn in the attached diagrams could also be made of transparent man-made material.

Patent Claims

1. Greenhouse (1) comprising a system of columns, trusses and gutters and a covering of window panes and the window pane attachment/support profiles, characterized by the fact that at least one pane attachment/support profile is constructed at least in part from a transparent material.

2. Greenhouse (1) in accordance with conclusion 1 characterized by the fact that at least one roof ridge profile is constructed from a transparent material.

3. Greenhouse (1) in accordance with conclusion 1 or 2 characterized by the fact that at least one windowsill profile is manufactured from a transparent material.

4. Greenhouse (1) in accordance with one of the foregoing conclusions, characterized by the fact that at least one gutter edge profile is constructed from a transparent material.

5. Greenhouse (1) in accordance with one of the foregoing conclusions, characterized by the fact that at least one window edge profile is manufactured from a transparent material.

6. Greenhouse (1) in accordance with one of the foregoing conclusions, characterized by the fact that at least one rod profile is manufactured from a transparent material.

7. Pane attachment/support profile structure for a greenhouse, in accordance with one of the foregoing conclusions, characterized by the fact it is constructed from transparent material

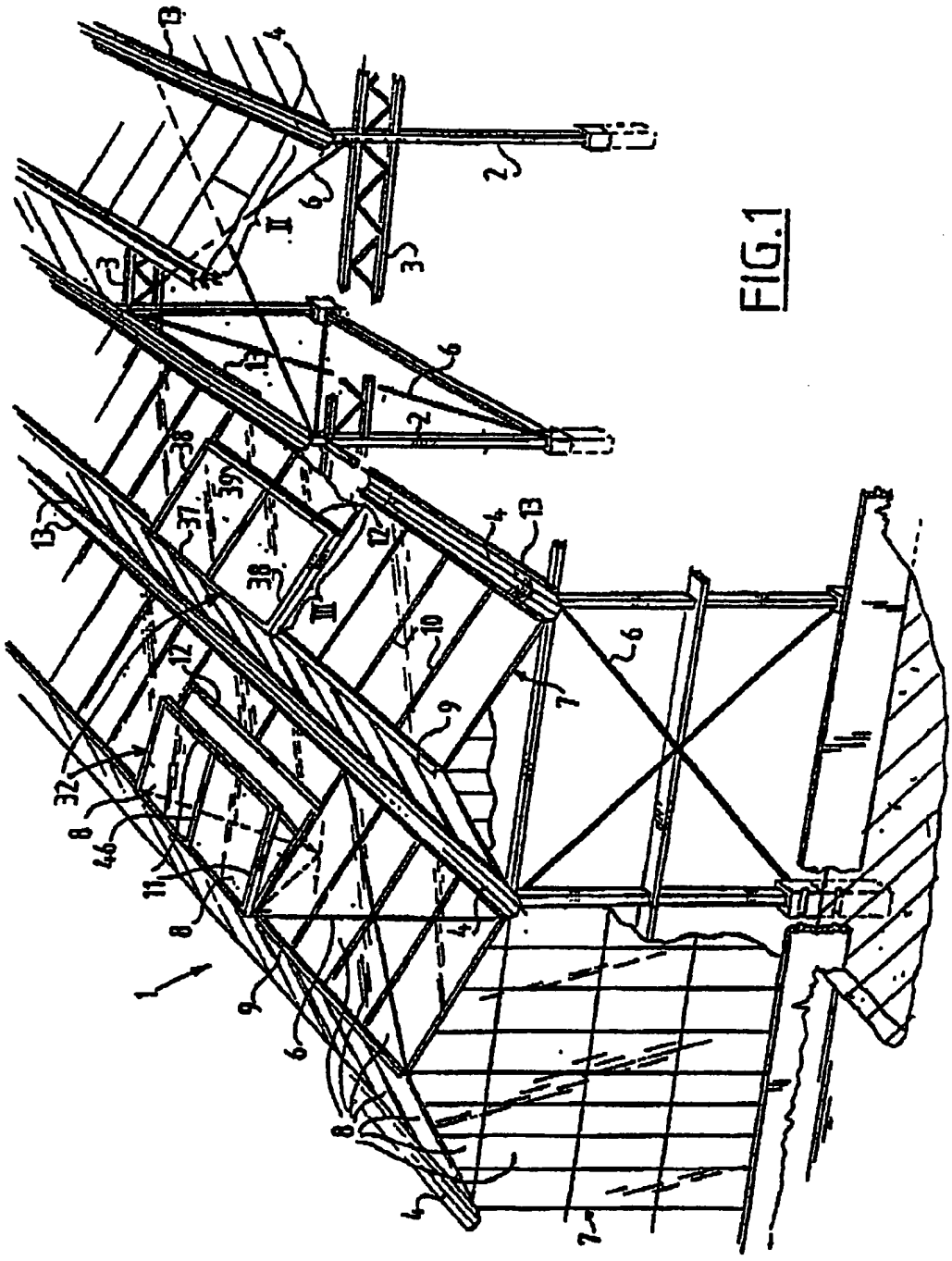

FIG.1

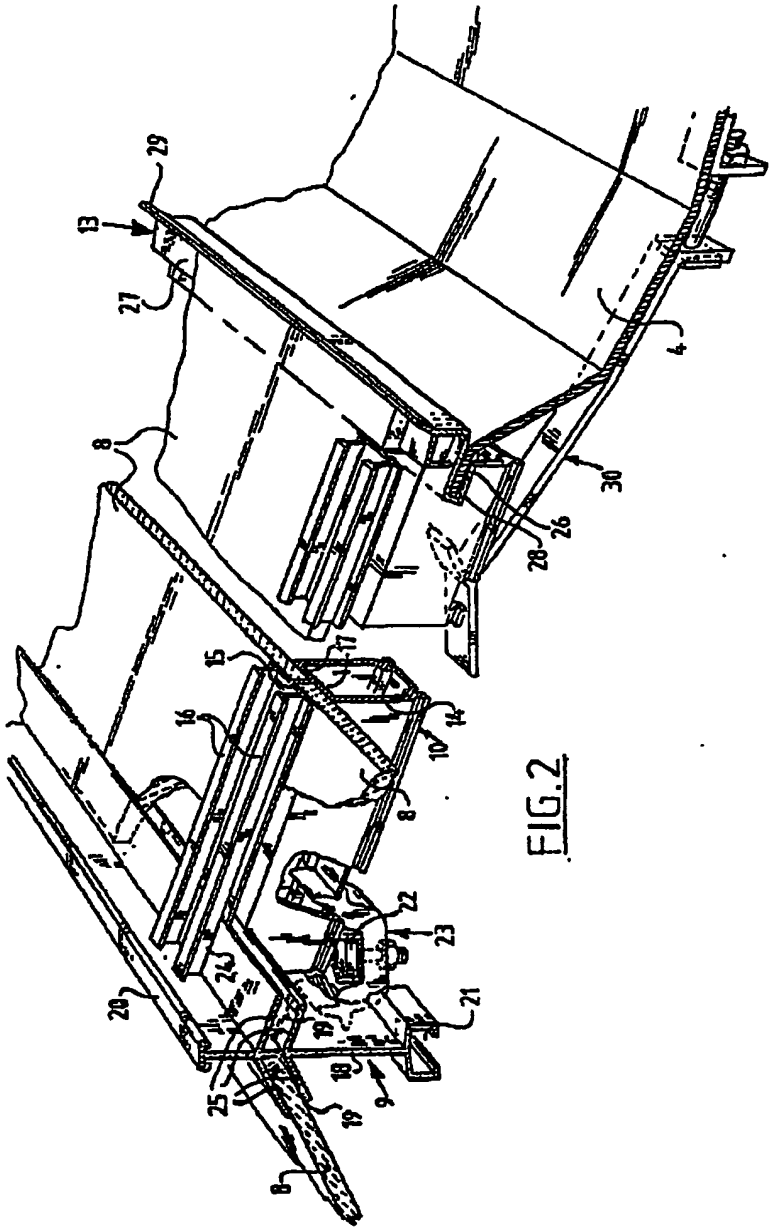

FIG.2

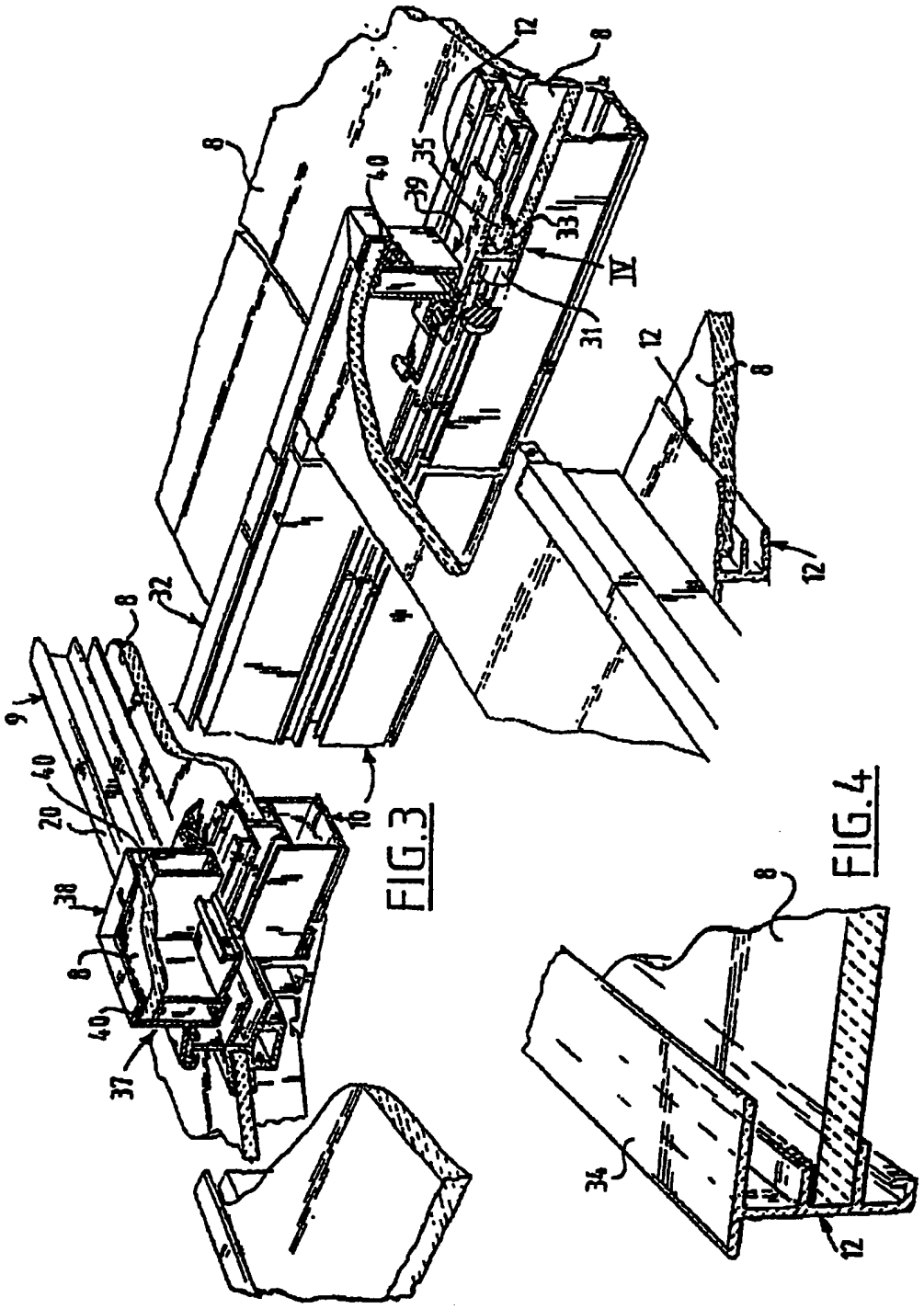

FIG.3

FIG.4

PATENT COOPERATION TREATY

Report regarding the examination of the International Application according to Article 21 § 9 of the Belgian law on Patents of Invention of March 28, 1984

IDENTIFICATION OF THE NATIONAL APPLICATION	REFERENCE OF THE APPLICANT OR AGENT M. Kon/mh/1 Boal
Belgian national application No. 9100062	Date of application January 24, 1991
	Earliest priority date
Applicant (Name) BOAL SYSTEMEN B.V.	
Date of request of international type examination March 18, 1991	Reference number assigned by the Office of International Examination (OIE) to the application for examination for an international type patent. SN 17634 BE
I. CLASSIFICATION OF THE SUBJECT MATTER (when different classifications apply, give all the classification symbols)	
According to the International Patent Classification (IPC) or at the same time according to the national classification in the IPC Int. Cl.[5] A 01 G 9/14	
II. INVESTIGATED AREAS OF TECHNOLOGY	
Investigated minimum documentation	
Classification system	Classification symbols
Int. Cl.[5]	A 01 G
Documentation other than the minimum documentation for so far similar document in the investigated fields are included	
III. ☐ N/A-	
IV. ☐ N/A–	

V. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	**Citation of document with indication where appropriate of relevant passages or drawings.**	**Relevant to Claim(s) No.**
X	US, A, 4 736 563 (BILLHORN) April 12, 1988 see column 1, line 38 - line 45 see column 2, line 37 - column 3, line 20; Figure 1 ---	1, 5, 7
X	DE, A, 3 144 530 (VEKAPLAST) June 16, 1983 see page 8, paragraph 1 - page 10, paragraph 4; Claims 8, 12; Figures 1-4 ---	1, 5, 7
X	DE, A, 2 941 202 (KUNSTSTOFFABRIK ERICH DITTRICH) April 30, 1981 see page 9, line 1 - line 2; Figures 1, 2 —	4

Special categories of cited documents:

A: document defining the general state of the art, which is not considered to be of particular relevance.

E: earlier document but published on or after this filing date.

L: document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified).

O: literature which concerns an [illegible] disclosure, a use, an exhibit or another medium

P: document published prior to the filing date but later than the priority date claimed

T: later document published after the filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention.

X: document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step.

Y: document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

&: document member of the same patent family.

VI. DECLARATION	
Date of the actual completion of the international examination SEPTEMBER 4, 1991	**Date of mailing of this international examination report**
International examination authority	**Signature of authorized officer** J. J. HERYGERS *[Signed]*

APPENDIX BELONGING TO THE REPORT REGARDING EXAMINATION OF NOVELTY OF THE INTERNATIONAL TYPE, CARRIED OUT FOR PATENT APPLICATION No.

BE 9100062
SN 17634

The Appendix contains a list of earlier published patent applications or patents (so-called list of the same patent family), which correspond to the patents cited in the report

The report is composed with the aid of the data of the computer base of the European Patent Office as of 9/4/91.

The correctness and completeness of this report is not guaranteed by the European Patent Office nor by the Patent Office; the data are provided for the purpose of information.

patent document named in the report	date of publication	corresponding document(s)	date of publication
US-A-4736563	4/12/88	None	
DE-A-3144530	6/16/83	None	
DE-A-2941202	4/30/81	None	